AMERICAN SOCIETY FOR TESTING MATERIALS
BULLETIN

260 SOUTH BROAD STREET PHILADELPHIA, PA.

"Promotion of Knowledge of Materials of Engineering and Standardization of Specifications and Methods of Testing"

NUMBER 74 April 30, 1935

Annual Meeting of Widespread Interest Planned

Fifteen Sessions Will Be Held During Week of June 24-28

THE approaching Thirty-eighth A.S.T.M. Annual Meeting to be held in Detroit, June 24–28, at The Book-Cadillac hotel, promises to be an outstanding one in many respects. In order to provide ample time for the presentation of the many interesting technical papers and reports included in the program, 15 sessions are planned. Much interest has already been shown in the meeting and exhibit and a fine attendance is anticipated.

During the week of the annual meeting, the Society's Third Exhibit of Testing Apparatus and Related Equipment will be in progress. A separate exhibit article appears on page 5.

The two rooms in which the formal Society sessions will be held, the Exhibit and the registration and information desks will all be located on the Fourth or Grand Ballroom Floor of the hotel, thus concentrating meeting activities.

It will be noted from the Provisional Program which appears on page 9 that the first formal session is scheduled to begin at 10 o'clock, Tuesday morning. Many of the Society committees will take advantage of Monday to hold meetings. On Wednesday evening the A.S.T.M. dinner is to be held at which the Dudley Medal will be awarded. This is to be followed by two addresses on the subject of housing developments as indicated below.

There are a number of unusually interesting places and plants to be visited in the Detroit area and Thursday afternoon has been set aside for plant visitations and other events. Industrial trips will be planned for Tuesday afternoon and Friday for those who wish to go on these days.

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is enclosed for members' use in securing preprints of Reports and Papers

HOTEL RESERVATIONS SHOULD BE MADE PROMPTLY

Technical Sessions

The best way of getting a complete preview of the technical program is to study in detail the Provisional Program, which is complete with synopses of the technical papers and reports.

A large number of papers were offered to the Committee on Papers and Publications and as many outstanding ones as possible were accepted. Advance indications point to the inclusion in the final program of 48 technical papers and 45 reports from the various committees.

Two subjects of very widespread interest will be included in the Program. The first of these, in which three papers will form the basis of the discussion, is scheduled for Tuesday evening; the subject "The Place of Materials in Automobile Roads and Rides." The plans for this session including the procurement of the speaker have been handled by the Program Committee, of the Detroit Committee on Arrangements, under the chairmanship of Mr. T. A. Boyd. The purpose of the three papers to be given is to outline systematically the part which materials play in the automotive and highway fields. The committee intends that the session will be of particular interest to the members and visitors at large, rather than to specialists in these particular fields. The authors (see page 10) plan to discuss materials problems and also indicate certain improvements which appear to be desirable and which may be forthcoming in the near future.

The other session which should be of interest to every member and visitor at the meeting concerns "The Relationship of Materials to the House of Today and Tomorrow." Plans for this session which are being consummated by the Detroit Program Committee call for two speakers, one covering the Administration's viewpoint in housing and another an illustrated address of what is being done in this country and abroad to solve a number of the housing problems. It is expected that an official of the Federal Housing Administration will deliver the first address and J. E. Burchard, Vice-President, Bemis Industries, Inc., who is an authority on the subject of modern housing, will present the second.

Opening Session Tuesday Morning

The first formal meeting session will be held on Tuesday morning. Following an address on "Where Is Detroit Going," by Harvey J. Campbell, Jr., Secretary, Detroit Board of Commerce, C. H. Hirshfeld, Chief of Research Dept., Detroit Edison Co., will present an address on the "Relation of Specifications to the Engineering Profession," and the annual President's Address will then be given by Doctor von Schrenk.

The session on Tuesday afternoon will be devoted to testing, including a number of interesting papers and several committee reports, to be followed Tuesday evening by the Symposium on the Place of Materials in Automobile Roads and Rides. Simultaneous sessions are scheduled for Wednes-

day morning, one being devoted to ferrous materials, the other to paints, naval stores and timber.

Preceding the Marburg Lecture which will be delivered late Wednesday afternoon there will be a short session devoted to rubber products and petroleum. Dr. L. B. Tuckerman of the National Bureau of Standards will deliver the lecture on "Aircraft: Materials and Testing" (see page 6).

On Thursday morning, two sessions are scheduled, one devoted to corrosion and its related problems and the second to coal and coke, textiles and electrical insulating materials. The sessions on Thursday evening are devoted respectively to fatigue and effect of temperature on metals, and waterproofing and road and paving materials. Two sessions will be held on Friday morning, one devoted to several papers discussing various aspects of the spectrographic analysis of materials and the other including papers and reports on ceramic and masonry materials subjects.

A particularly strong non-ferrous session will be one of the features of the annual meeting to be held Friday afternoon. The closing session on Friday evening includes a number of interesting papers and reports in the field of cement and concrete.

No attempt has been made here to indicate the interesting papers which will be included in each of the various sessions. The titles of the papers, authors and synopses given in the Provisional Program should serve to acquaint the members with items which will be of most interest to them.

Committee Reports

A number of the committees will present outstanding reports at the annual meeting. Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys will present for the first time specification requirements covering a number of materials in its field on which the committee has been working for a number of years. Reports of the two corrosion committees, A-5 and B-3, will include a great deal of data which have been developed from inspections of the various specimens which have been on test. The A-5 report will include a second report on hardware specimens. Committee D-14 on Screen Wire Cloth has had an extensive series of corrosion tests under way for a number of years and plans to include in its report extensive data and discussion on results of this work. One of the features of the report of Committee D-19 on Analysis of Industrial Waters is to be a statement intended to focus attention on the necessity of securing proper samples of water. There appears to be very little literature on this particular subject.

Committee B-6 on Die-Cast Metals and Alloys has prepared a very interesting report including presentation of extensive data developed from the corrosion tests which have been under way for five years. No less than five appendices are anticipated for the report of Committee C-9 on Concrete and Concrete Aggregates. These will cover various aspects of permeability, analysis, data on compression tests, papers on durable concrete and another on volume changes in concrete.

EARLY CRAFTS SHOPS . . EDISON MUSEUM

These shops are arranged as in an early American village street. Included are the shops of the pottery worker, tinsmith, candlemaker, gunsmith; also a hardware store, shoe, tailor and pewter shops, and several others.

Dudley Medal Award

A feature of the dinner on Wednesday evening will be the award of the Charles B. Dudley Medal for 1935. The Committee on Awards, Messrs. J. R. Freeman, Jr., H. J. Gilkey, and Allen Rogers after careful consideration have selected Messrs. C. A. Hogentogler and E. A. Willis, joint authors, as the winners.

This medal is awarded annually to the author of the paper presented at the preceding annual meeting which is of outstanding merit and constitutes an original contribution to materials research. The winning paper was entitled "Subgrade Soil Testing Methods."

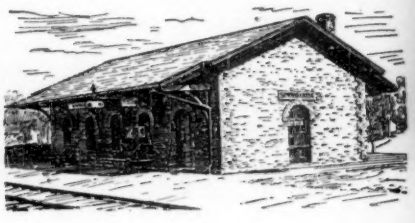
Mr. Hogentogler, Senior Highway Engineer, U. S. Bureau of Public Roads, received his C.E. degree from Pennsylvania State College and after serving as instructor there, completed a period of service with the State Highway Dept. and served as engineer, Columbia, Pa. He became Assistant Professor of Civil Engineering, University of Illinois, 1915. Later he was Assistant Physicist, National Bureau of Standards, and Assistant Highway Engineer, Bureau of Public Roads. He has been active in the work of the Highway Research Board, American Road Builders Association and American Association of State Highway Officials.

E. A. Willis received his education at the University of Minnesota and Iowa State College, receiving his degree, B.S. in Civil Engineering, from the latter. He has been employed by the Division of Tests, U. S. Bureau of Public Roads, on subgrade soil research since 1922, and has been Assistant Highway Engineer, in charge of soil research projects, since 1930.

Entertainment

The Detroit Committee on Arrangements headed by Dr. A. E. White, University of Michigan, and its several committees in charge of the various details of the meeting plan to leave no stone unturned to make this week an outstanding one. A Ladies' Entertainment Committee headed by Mrs. F. O. Clements has prepared a number of interesting events for ladies, as detailed on the enclosed Ladies' Entertainment Program. Members are requested to give this Program to their families after reviewing it.

The annual golf tournament will be held on Thursday afternoon, and a number of industrial and other trips and excursions are being planned. Further details on all entertainment features and other related events during the annual meeting week will be given in a later communication to the members, and additional information can be obtained at any time during the week from the headquarters of the Detroit Committee which will be located near the A.S.T.M. registration desk.



SMITH'S CREEK DEPOT . . . GREENFIELD VILLAGE

This is the identical depot where Thomas Edison, a boy of fifteen, was ejected from the train on which he worked as news agent.

Each Member Can Secure Preprints on Request

Each member of the Society can secure a copy of any of the technical papers and reports which will be preprinted in advance of the meeting by returning promptly the Preprint Request Blank enclosed with this BULLETIN. This blank should be carefully marked and the signature and address of the member clearly indicated. The Provisional Program will enable members to make a selection of the items desired.

Preprints will be forwarded to the members, probably in three installments. *Each member should note that preprints will not be sent unless requested.*

Written Discussion

It is important that all written discussion shall be in the hands of the Assistant Secretary prior to the session at which it is to be presented. Such written discussion takes precedence over oral. For both types the speakers will, in general, be limited to five minutes, but this time may be extended at the discretion of the Chair, or by vote of the meeting. Written discussions requiring more than five minutes for presentation should be accompanied by an abstract and at the discretion of the Chair shall be presented in abstract only.

Hotel Reservations and Advance Registration

While there will be ample room accommodations for the members at The Book-Cadillac Hotel, it is desirable that where members know when they will arrive they make reservations as soon as possible. For that purpose the enclosed return card addressed to the hotel management can be used. The various hotel rates are given on this card. There are a number of other hotels available in Detroit including: Detroit-Leland, Fort Shelby, Statler and Tuller.

In order to expedite registration of members as they arrive at the meeting, it is desirable to have as many registration details taken care of in advance as possible and it will be very helpful if members will fill out and mail promptly to Society Headquarters the enclosed advance registration card.

Registration Procedure

Members and visitors should register at the A.S.T.M. desk as promptly as possible after their arrival at the hotel. Each member will receive the usual badge and preprint copies of any of the reports and papers desired. The members' registration fee is $1. Visitors will receive the badge and may secure preprints for any two sessions of the meeting. The visitors' fee is $1, but if a complete set of preprints is desired they may procure them with a payment of $1 additional.

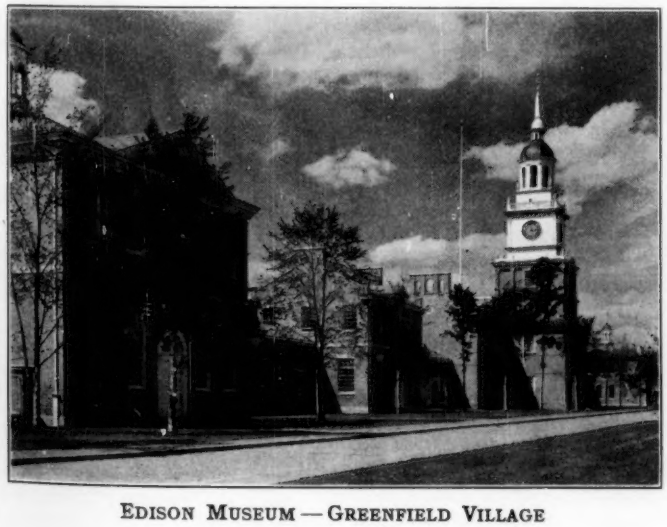
Reduced Railroad Rates

Round-trip tickets will be sold at one and one-third single fare to holders of identification certificates who plan to go and return by the same route, and two-thirds of the fare each way, going and returning by a different route. Both plans have a return limit of 30 days from date of sale. The date of sale ranges from June 18 to 26, depending on the distance from Detroit. The certificates will be mailed to the members late in May and may be used only by them and dependent members of their families. Only one certificate is needed, since this will take care of both the member and his family. Certificates must be presented when tickets are purchased and must be validated at Detroit to be honored for the return trip.

Companies, firms, etc., holding corporate Society membership which desire to send more than one individual to represent them at the annual meeting can secure a certificate for each additional representative. Requests for additional certificates giving the names of individuals for whose use they are intended should be sent to the Society.

Steamer Travel

A number of the members may wish to take advantage of the steamer facilities which operate between Buffalo, Cleveland, Chicago and Detroit. The Detroit and Cleveland Navigation Co. has agreed to accept the rail portion of a convention ticket between Buffalo and Detroit, or Cleveland and Detroit under the identification certificate plan, the only additional charge being for meals and berth. Steamers leave Buffalo daily at 6 P.M., arriving in Detroit at 9 o'clock the following morning. The departure from Cleveland is at 11.30 P.M. and the arrival in Detroit, 6.45 the following morning. Berths range from $1.25 up and rooms $2.50 up. Full details on steamer schedules, berth charges and rates for meals can be obtained by writing the company, 1918 Channin Building, New York City, or offices in the lake cities.



EDISON MUSEUM — GREENFIELD VILLAGE

BELLE ISLE PARK

IV. Long-Time Society Committee Members

Fourth in the Series of Notes on Long-Time A.S.T.M. Members

CONTINUING the series of articles in the A.S.T.M. BULLETIN comprising notes on the outstanding activities of long-time members of the Society, there appear below outlines of the work of three additional members. In general the men whose sketches will appear in this series will have been affiliated with the Society for 25 years or more and will have taken part in committee work for long periods. No definite sequence is being followed in these articles.

LAWFORD H. FRY, Railway Engineer, Edgewater Steel Co., received his technical training at the City and Guilds of London (England) Technical Institute, the University of Göttingen and the Hannoversche Technische Hochschule. Following a period of service with the Baldwin Locomotive Works, he became Engineer of Tests and in 1905 was transferred to London and Paris as European Technical Representative of this organization. Returning to this country in 1913, he took charge of the Metallurgical Department of the Standard Steel Works and remained with this company as metallurgical engineer until 1930. Since that time he has held his present position.

Mr. Fry's membership in the Society dates from 1905. On his return from abroad in 1913, he began active work on Committee A-1 on Steel and since that time has been a member of a number of its subcommittees including those on Spring Steel, Forgings, Steel Wheels and Tires, Castings, and Methods of Physical Tests. For several years he was chairman of the A-1 Subcommittee on Nomenclature and Definitions and has been chairman of the Subcommittee on Methods of Physical Tests since 1930. He is the representative of the Steel Committee on Committee E-1 on Methods of Testing and also on Committee E-8 on Nomenclature and Definitions.

Mr. Fry is a member of a number of American, English and French societies. In addition to his book "A Study of the Locomotive Boiler" he has contributed a large number of articles on locomotives and metallurgical subjects to the technical press of this country and England.

G. H. CLAMER, President and General Manager, The Ajax Metal Co., is a graduate of the University of Pennsylvania, receiving his B.S. degree in chemistry in 1897. He established a chemical laboratory at The Ajax Metal Co. that year and has been associated with this company since that time. In 1933 he was awarded the honorary degree of Doctor of Science by Ursinus College.

He did much pioneer work in chemical phases of the non-ferrous industry. In 1901 he received the Elliot Cresson Gold Medal of the Franklin Institute for the invention of a refining process which resulted from improvement of methods of employing scrap metals. At the 1933 convention of the American Foundrymen's Association he was awarded the Joseph S. Seaman Gold Medal for outstanding achievements in the metal casting industry.

A member of A.S.T.M. since 1902 (one of the earliest members from the non-ferrous industry) he has taken an active part in many phases of Society work, particularly in Committee B-2 on Non-Ferrous Metals and Alloys. He has been a member of this committee since its organization in 1909 and did much to initiate a number of features of its work. With the organization in 1912 of the Subcommittee on White Metals, Tin, Lead, and Zinc, he was elected chairman and has served continuously since that time, and has been chairman of the Subcommittee on Non-Ferrous Alloys for Railroad Equipment since it was formed in 1916. He has been active in the work of Committee B-5 on Copper and Copper Alloys, Cast and Wrought and is chairman of the Special Committee on Promotion of the Use of Specifications for Copper Alloys in Ingot Form. He represents the Society on the Metallurgical Advisory Committee of the Bureau of Standards and is a member of the Philadelphia District Committee. From 1918–1919 Doctor Clamer was President of the Society.

He has been active in the work of a number of societies, is a charter member of the American Electro-Chemical Society and is one of the original American members of the British Institute of Metals. He is a past-president of the American Foundrymen's Association.

G. B. HECKEL, since 1891 Editor-Publisher, *Drugs, Oils and Paints*, received his education at Ursinus College and the University of Pennsylvania. He has taken a leading part in many fields of activity in the paint, varnish and allied industries. Mr. Heckel's membership in A.S.T.M. dates from 1895 when he became a member of Committee D-1 on Preservative Coatings for Structural Materials. He has also held membership for a number of years on Committee D-10 on Shipping Containers and several of its subcommittees. He took an active part in the very extensive series of paint tests which Committee D-1 sponsored during the period from 1906 to 1915, including the Havre de Grace bridge paint tests, and the paint tests at Arlington and Atlantic City.

Mr. Heckel was vice-chairman of Committee D-1 until 1920 and from 1918 to 1920, he served as a member of the A.S.T.M. Executive Committee.

In his book "The Paint Industry—Reminiscences and Comments" Mr. Heckel has a very interesting chapter devoted to the A.S.T.M. and Committee D-1 in which he records many interesting phases of the committee's work.

For many years Mr. Heckel was Secretary-Treasurer of the Paint Manufacturers Association and the National Varnish Manufacturers Association. When these two associations combined, he was chosen secretary. Since 1921 he has been Secretary of the Federation of Paint and Varnish Production Clubs which he helped to organize. He is an honorary member of the International Association of Master Painters and Decorators and has been for many years a member of the American Chemical Society.

Interesting Exhibit to Feature Annual Meeting Week

New Apparatus and Laboratory Supplies will be on Display

IN the March BULLETIN, mention was made of the forthcoming Exhibit of Testing Apparatus and Related Equipment to be in progress during the five days of the annual meeting, June 24–28 at The Book-Cadillac, Detroit. An interesting Exhibit is being planned which will afford members an opportunity to see at first hand new apparatus which has been developed and advances which have been made in the laboratory supply and instruments field. In addition to a number of novel displays which are being planned, the Exhibit will feature also apparatus that meets the requirements of various A.S.T.M. tests and specifications.

Exhibitors

The advance list of exhibitors given below includes a number of the leading industrial concerns in the testing instrument and laboratory supply field.

Baldwin-Southwark Corp.
Bausch & Lomb Optical Co.
Christian Becker, Inc.
Central Scientific Co.
Detroit Testing Machine Co.
Eberbach & Son Co., Inc.
Emil Greiner Co.
Federal Pneumatic Systems, Inc.
Illinois Testing Labs., Inc.
Instruments Publishing Co.
Leeds and Northrup Co.
"Metals and Alloys"
Tinius Olsen Testing Machine Co.
The Palmer Co.
Parr Instrument Co.
Precision Scientific Co.
Riehle Testing Machine Division of American Machine and Metals, Inc.
Shore Instrument and Manufacturing Co.
C. J. Tagliabue Manufacturing Co.
Testing Machines, Inc.

Detailed information on the types of equipment which will be on display will be included in the Directory of Exhibits which will be part of the final printed program for the meeting. In the booths of the above companies will be found a wide range of apparatus used in investigating properties of materials. This will include universal testing machines, balancing equipment, various types of impact machines, hardness testing equipment for metals and non-metallic materials, ductility testers, petroleum testing apparatus, thermometers, hydrometers, laboratory ovens, strain measuring instruments, and technical books and publications. There will also be electrical measuring and recording instruments used in testing, various types of laboratory metalware and glassware, metallographic equipment, microscopes, spectrographs, refractometers, colorimeters, bomb calorimeters, melting point apparatus, pyrometers, balances, etc.

A.S.T.M. Committees will Participate

A number of displays of widespread interest sponsored by certain committees of the Society have been features of the two previous exhibits and several committees are planning to take part in the Exhibit this year. Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys is planning a very extensive set-up showing a large number of the corroded specimens which have been collected from the various test racks in different parts of the country. These include specimens exposed to atmospheric corrosion, galvanic and electrolytic corrosion and totally immersed specimens. Committee E-4 on Metallography is planning to illustrate the types of work that come under the jurisdiction of the committee and a large number of illustrations including X-ray photographs will be displayed. Committee D-9 on Electrical Insulating Materials will participate and also Committee D-15 on Thermometers and Laboratory Glassware.

Committee B-6 on Die-Cast Metals and Alloys has plans under way for an extensive display featuring phases of its work. Committee D-2 on Petroleum Products and Lubricants will sponsor a booth display consisting of many of the instruments and apparatus referred to in the A.S.T.M. test methods for petroleum products. Companies in the Exhibit will loan the apparatus to the committee. Other committees are also giving consideration to displays.

Research Laboratories

In various research laboratories—industrial, educational and governmental—there are a number of unusual types of instruments and apparatus used in performing special tests and carrying out research work. A number of such laboratories have been invited to participate in the Exhibit.

To mention some of the apparatus which would be included, a new low-capacity impact machine and a machine for making bending tests in wire used for mounting vacuum tube elements will be on display through the courtesy of the Bell Telephone Laboratories. The Materials Testing Laboratory of the University of Illinois has developed a Boone machine for conducting high-speed fatigue tests of metals at low temperatures. A paper presenting results of tests made with one of these machines is to be presented at the meeting and one of the machines will be on display in the Exhibit. It is expected that the Dept. of Engineering Research, University of Michigan, will have a display featuring special equipment, and other laboratories will take part.

These displays are considered an important part of the Exhibit, adding as they do to the general interest in the Exhibit as a whole and indicating especially to visitors some of the important work being done to develop adequate knowledge of the properties of engineering materials.

Detroit Exhibit Committee

The Detroit Committee on Exhibit is taking an active part in making arrangements. One of the projects on which the committee is working will be a display in the Society booth and a real surprise will be in store for the members. The personnel of the committee is as follows:

C. H. Fellows, *Chairman*, The Detroit Edison Co.
J. L. McCloud, Ford Motor Co.
W. E. McCullough, Bohn Aluminum and Brass Corp. (Alternate: C. H. Morrison)
Ralph W. Perry, Perry Testing Laboratory
W. P. Putnam, Detroit Testing Laboratory
H. R. Wolf, General Motors Corp.

Exhibit in Grand Ballroom

The Exhibit will be held in the Grand Ballroom (Fourth Floor) of The Book-Cadillac. This is the floor on which the two Society session rooms are located and the A.S.T.M. registration desk will be adjacent to the entrance to the Exhibit. The Grand Ballroom is fully air-conditioned.

Paint Symposium to be Published Soon

The editing of the 15 papers together with discussion submitted in connection with the Symposium on Paint and Paint Materials, held at the 1935 Regional Meeting in Philadelphia in March, is well in hand. It is estimated that the reprint volume will comprise about 125 pages and in view of the enthusiastic reception the papers received, it is anticipated that there will be a widespread distribution of the volume. Further announcement will be made as soon as the volume is available.

American Society for Testing Materials

BULLETIN

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Number 74 **April 30, 1935**

The Annual Meeting Beckons

FROM the Provisional Program and other announcements appearing in this BULLETIN it is very evident that a most interesting Annual Meeting is in prospect. The Detroit Committee on Arrangements, under the chairmanship of Dr. A. E. White, has spared no effort in insuring that the meeting will be an outstanding one in every respect. The technical program itself, with its special sessions on Housing and on the Part Played by Materials in Roads and Rides, represents one of the strongest programs ever developed. Apart from this, the Committee has provided many attractive items of interest both for the members and their families. In addition we have the Third Exhibit of Testing Apparatus and Related Equipment. All of which augurs well for an outstanding successful meeting from every viewpoint.

We look upon this Annual Meeting as a real opportunity: (1) An opportunity for extending one's knowledge in the field of materials and testing; (2) an opportunity to participate in discussions; (3) an opportunity to contribute in the work of committees; (4) an opportunity for association and fellowship and broadening one's acquaintanceship; (5) but above all an opportunity to become a vital part of A.S.T.M. The Annual Meeting is such an essential phase of A.S.T.M. work that anyone attending it cannot help but carry away a better appreciation of this important work.

The Detroit Committee expects a large attendance and we confidently expect that everyone who can will be present. Detroit is situated close to the "center of gravity" of our membership—and available transportation facilities make it possible for a large portion of those in A.S.T.M. both from this country and Canada to get there with not more than one day's travel. A.S.T.M. membership will mean that much more for everyone who takes advantage of the many opportunities that attendance offers.

L. B. Tuckerman—Marburg Lecturer

Dr. L. B. Tuckerman, Principal Scientist and Assistant Chief, Division of Mechanics and Sound, National Bureau of Standards, Washington, has accepted the invitation to deliver the Tenth Edgar Marburg Lecture at the 1935 A.S.T.M. annual meeting in Detroit. His lecture will deal with the subject "Aircraft: Materials and Testing." Doctor Tuckerman has taken a very active part in many developments in the aviation and airship field and as a result of this and his work in related scientific fields an outstanding lecture is anticipated. He plans to trace the development and utilization of materials in aircraft and will make some approach to the subject from the angle of the influence of design and construction on the development of materials.

L. B. TUCKERMAN

Doctor Tuckerman is a native of West Williamsfield, Ohio. He attended public schools in Cleveland and after graduating with honors from Adelbert College of Western Reserve University, 1901, he was a graduate student in physics, University of Nebraska, later studying at the University of Berlin, Germany. He received his Ph.D. degree from Johns Hopkins University in 1921. He was for a time Assistant in Physics, Ohio State University and until 1919 was successively Instructor, Associate Professor, and Professor of Physics at the University of Nebraska. He became Associate Engineer Physicist at the National Bureau of Standards in 1919 and was appointed Assistant Chief, Division of Mechanics and Sound, 1925, and has been in this position and Principal Scientist (Engineer Physicist) at the Bureau since 1928.

A member of A.S.T.M. since 1922, Doctor Tuckerman has taken part in various phases of Society committee work. Under the National Advisory Committee for Aeronautics he has been a member of the Subcommittee on Aircraft Structures since 1927 and Committee on Methods and Devices for Testing Aircraft Materials and Structures since 1931. He was active on the special committees on the design of the ZR-1 Airship (Shenandoah) and the Army Semi-Rigid Airship RS-1.

Doctor Tuckerman has contributed numerous articles to the scientific and technical press on optics, aerodynamics and testing of materials and structures. He was the author of several reports issued by the N.A.C.A. and has contributed papers and discussion to A.S.T.M. *Proceedings*, and has collaborated in a number of the research papers published by the National Bureau of Standards. Technical contributions bearing his name which have been published within recent years discuss such subjects as friction in measurement, test of a flat steel plate floor under loads, columns with variable end restraints, the strength of metal tubing, an analysis of the deformation of the mooring spindle of the Shenandoah, etc.

Chemistry of Deterioration

At the very successful local meeting held in New York in March, jointly sponsored by the New York District Committee members and Committee D-9 on Electrical Insulating Materials, Prof. Hugh S. Taylor, Head, Department of Chemistry, Princeton University, spoke on the "Chemistry of Deterioration." Because this subject is one of great interest and concern to a large number of A.S.T.M. members, an abstract of his address is given below.

Professor Taylor opened his address by pointing out that "The Chemistry of Deterioration" was, in fact, just chemistry applied to the prevention of undesirable reactions and that with a complete knowledge of general theoretical chemistry it would be possible to cope with any problem of deterioration. He indicated that chemical reactions occur by virtue of the rearrangement of protons, electrons and neutrons with different energy levels for the various arrangements, but by no method can the energy level be raised to prevent a reaction.

Means at our disposal to prevent undesirable reactions can be listed in three classes:

1. Prevention of mutual access of the reactants.
2. Elimination of positive catalysts.
3. By the use of inhibitors (negative catalysis).

As an example of the first class, Professor Taylor called attention to the use of paints and protective coatings which serve to prevent, in the case of a steel structure, for instance, the access of oxygen and moisture to iron and therefore prevent rusting.

Under the second class, he discussed a problem with which he was actively associated in the earlier days of the automobile industry with its open sports' models. It seems that brown artificial leather, which was all the vogue, deteriorated much more rapidly than the less popular black artificial leather. It was finally found that the pigment used in the brown artificial leather contained a positive catalyst which accelerated the oxidation of the castor oil-nitrocellulose film with attendant cracking and deterioration. Elimination of the positive catalyst from the pigment permitted the production of a brown artificial leather of enhanced stability.

In the course of this investigation, however, it was found that black artificial leather was more stable than an unpigmented variety and here was an example of the third class of means for preventing undesirable reactions. It developed that certain materials in the carbon black used for coloring black leather had the effect of materially delaying the oxidation of such leather. Professor Taylor said that he had first studied a typical phenomenon of this character in Bodenstein's laboratory in Hanover many years ago. The particular reaction in question was the formation of hydrochloric acid from hydrogen and chlorine in the presence of visible light. This reaction, which ordinarily proceeds with great rapidity, fails to take place in the presence of small amounts of oxygen. Professor Taylor pointed out that this was a typical chain reaction and gave the following equation for it:

$$H_2 + Cl \rightarrow HCl + H$$
$$H + Cl_2 \rightarrow HCl + Cl$$

In other words the presence of an atom of either hydrogen or chlorine is required to start the reaction, but once the reaction is thus started, it proceeds spontaneously, due to the fact that the reaction sequence is self-perpetuating. Now, as was pointed out, the presence of oxygen, with its great avidity for hydrogen atoms, prevents this reaction because the oxygen combines with the hydrogen, removing them from the sphere of action. Professor Taylor indicated that, in practically all cases of reactions that could be inhibited, it had been found for those investigated, that they were chain reactions. He stated that a number of reactions which, in the past, were believed to be unimolecular reactions were now being found to be chain reactions. Attention was called to a recent book by Semenoff of over 500 pages on chain reactions alone; also mention was made of the recent work of Rice and Herzfeld in which it has been shown that free radicals play an important part in many chain reactions formerly regarded as unimolecular.

Professor Taylor pointed out the tremendous commercial importance of inhibitors and referred specifically to the prevention of the deterioration of rubber, fats, oils and gasoline by the use of as little as one part in one hundred thousand of anti-oxidants. He said that the surface of the phenomena of chain reactions had barely been scratched and that recent advances in the field opened up a whole new avenue of research of enormous scientific and commercial importance.

Nominations for Officers

The following nominations for officers are announced:

For President:

H. S. VASSAR, Laboratory Engineer, Public Service Electric and Gas Co., Irvington, N. J.

For Vice-President:

A. E. WHITE, Professor of Metallurgical Engineering and Director of Department of Engineering Research, University of Michigan, Ann Arbor, Mich.

For Members of Executive Committee:

W. H. GRAVES, Chief Metallurgist, Packard Motor Car Co., Detroit, Mich.
R. L. HALLETT, Chemist, National Lead Co., Brooklyn, N. Y.
N. L. MOCHEL, Metallurgical Engineer, Westinghouse Electric and Manufacturing Co., Lester Station, Philadelphia, Pa.
H. H. MORGAN, Manager, Rail and Fastenings Dept., Robert W. Hunt Co., Chicago, Ill.
W. R. WEBSTER, Chairman of the Board, Bridgeport Brass Co., Bridgeport, Conn.

The nominations were made by the Nominating Committee the personnel of which was announced in the March BULLETIN. Each of the above nominees has indicated in writing his acceptance of his nomination. The By-laws provide that "further nominations, signed by at least 25 members may be submitted to the Secretary-Treasurer in writing by May 20, and a nomination so made, if accepted by the member nominated shall be placed on the official ballot" which "shall be issued to the members between May 20 and June 1."

Price Reduction Made on Effect of Temperature Symposium

To make the valuable data included in the *Symposium on the Effect of Temperature on the Properties of Metals* of still wider service and to reduce the remaining stock of the publication, the A.S.M.E. and A.S.T.M., joint sponsors of this volume have decided to put into effect a drastic price reduction. Formerly priced at $6, the 829-page volume can now be obtained at $3.50 per copy.

The 27 extensive papers prepared by 38 technologists were presented at two sessions jointly sponsored by the A.S.T.M. and A.S.M.E. in 1931. In the opinion of many this symposium was the most outstanding in scope and comprehensiveness of any held in the metals field. The extensive discussion on the many papers covers some 156 pages of text and there is a bibliography of 600 annotated references. Every effort was made in publishing the Symposium to make it a ready reference volume and it includes a complete subject and author index.

It furnishes up-to-date authoritative data of industrial needs and available metals for high- and low-temperature service, and discusses the power, chemical, oil, ceramic, metallurgical and other industries in detail.

Each paper in the publication represents not only the opinions of the authors, but the collected knowledge of many engineers in the respective fields.

The two societies have agreed that the A.S.T.M. will handle orders for the remaining stock of the book. Undoubtedly, many A.S.T.M. members will wish to avail themselves of the reduced price and obtain a copy and for convenience a special order blank is enclosed with this BULLETIN.

A Message from Robert W. Lesley

At the request of the Secretary-Treasurer Mr. Robert W. Lesley, the only living member among those whose names appear on the Society's charter, has furnished for the BULLETIN a message which is given below.

Robert Whitman Lesley, born in Philadelphia in 1853, received his education in France and at the University of Pennsylvania. In 1908 the University awarded him the degree of A.B. as of the class of 1871. After a business career in the newspaper field, becoming assistant editor of the Philadelphia *Ledger*, he studied law and was admitted to the bar in 1879. The firm of Lesley & Trinkle was organized in 1874 to deal in cement and The American, now Giant, Portland Cement Co. was founded in 1882 under inventions made by Mr. Lesley and a group of his associates.

ROBERT W. LESLEY

During the War he was a member of the Concrete Ship Committee and he managed the Clarke Thomson Aviation Research which was later associated with the National Advisory Committee for Aeronautics.

In the Society Mr. Lesley served as Treasurer from 1900 to 1902 and also as Vice-President from 1902–1912. For a number of years prior to 1883, Mr. Lesley was associated with David O. Saylor, the pioneer in the development of the American portland cement industry and during this period and later on, after the formation of the American Cement Company, he performed an important part in the pioneering, manufacturing and introduction of American portland cement. He is credited by his associates with being the leading figure in the industry in those early days which saw American cement gradually drive imported cement out of the market and finally later on, show a production of 175,000,000 barrels yearly as compared with 8000 to 10,000 barrels in the days of its beginning.

When the Portland Cement Association was formed in 1902 he was one of its founders and in recognition of his work was made the first President and later on an Honorary Member. In 1927 he was elected an honorary member of A.S.T.M. and he is also an honorary member of the American Concrete Institute. He has held membership on Committee C-1 on Cement from its organization in 1902, and he has been active in the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete and served as a member of the government board on fuels and structural materials appointed by former President Theodore Roosevelt. He is director of a number of industrial companies and past president of the Philadelphia Golf Assn. and also of the Seniors' Golf Assn.

Members will be interested in the following message from Mr. Lesley. His record of service in the Society is outstanding and he still maintains regular attendance at the meetings of the Society and Committee C-1 on Cement.

Dear Mr. Warwick:

You have asked me to prepare a little sketch for publication in the BULLETIN and I am glad to do this.

What I have done personally I do not believe will be quite as interesting to our members as to write as the sole survivor of the original applicants for our charter, some notes of the early days of our Society.

Way back in the '90's the former International Association for Testing Materials had a number of members in this country, many of whom were citizens of Philadelphia and the surrounding territory. Like many organizations with long distance between its central office and the membership, this led to difficulties. By reason of this many of us, interested in standardizing specifications and testing materials, felt that the remedy would be the organization of an independent American association to carry on this important work in the United States. Hence, the incorporation of the A.S.T.M. which was formed officially at Atlantic City on June 12, 1902. The names on the application for a charter for this organization of ours were the following:

Henry M. Howe	Mansfield Merriman
Charles B. Dudley	Albert L. Colby
Edgar Marburg	W. R. Webster
R. W. Lesley	

These names indicate what outstanding men in the field of engineering and testing materials were those who originally formed this association and it is with regret that I recall those distinguished organizers and realize that today I am the sole survivor of this little band. With Dr. Charles B. Dudley at the head, the most distinguished in his time of all the leaders in the field of testing materials, there was no doubt as to the success of the new Society.

These men assisted in the planting of the new association upon a substantial foundation and in its development during its early existence. It was no easy task from the standpoint of management and finance and as my recollection goes back there was a time when three of us joined in endorsing a note for the "large" sum of $1000 to carry the association over a serious bump. All that has passed away and now we see a strong, coherent, well-directed and well-financed organization carrying on in a leading position in its field and doing good work from year to year for many industries and the country at large.

Many amusing incidents occurred in the early days and I recollect one of our early conventions which was held at a hotel near the Delaware Water Gap. Much to the surprise of those who had selected the place, the first meeting of the delegates nearly resulted in a strike when it was discovered that the hotel was a temperance hotel.

When the International Association for Testing Materials had its meeting in New York in 1912 and brought with it a body of distinguished men from all over the world, our first thought was that our luncheons and dinners should include good, simple food so that our guests would not suffer by a drastic change in their fare. So successful was this that when the Association went on an excursion to West Point, the health report upon landing back in New York was O.K. for all, whereas the next day another prominent society had a similar entertainment for a group of foreign members and unfortunately, perhaps possibly from the lack of adequate "testing" the body on arrival back in New York had a number of "casualties."

In the early days of the Society, the drafting of specifications was almost a new field and many matters were very controversial ones—often resulting in fiery meetings but by good management the many difficulties were overcome and today are matters of rare occurrence.

Society Appointments

The appointment of the following Society representatives is announced:

F. O. CLEMENTS, Technical Director, Research Laboratories, General Motors Corp., on the Division of Engineering and Industrial Research of the National Research Council.

HERMANN VON SCHRENK, Consulting Timber Engineer, to represent the Society at the Winter Meeting of the American Association for the Advancement of Science to be held in St. Louis in December, 1935.

H. L. CURTIS, Principal Physicist, National Bureau of Standards and W. J. SHACKELTON, Bell Telephone Laboratories, to represent the Society on the new Sectional Committee on Electric and Magnetic Magnitudes and Units.

PROVISIONAL PROGRAM

FOR

THIRTY-EIGHTH ANNUAL MEETING

OF THE

AMERICAN SOCIETY FOR TESTING MATERIALS

DETROIT, MICH. THE BOOK-CADILLAC JUNE 24-28, 1935

Monday, June 24 **Open**

Committee Meetings

Tuesday, June 25 **10 A.M.** **First Session**

Opening Session

Address: "Where Is Detroit Going?" Harvey J. Campbell, Jr., Secretary, Detroit Board of Commerce.

Address: "Relation of Specifications to the Engineering Profession." C. F. Hirshfeld, Chief of Research Department, The Detroit Edison Co.

Annual Address by the President. Hermann von Schrenk.

Annual Report of the Executive Committee. C. L. Warwick, Secretary-Treasurer.

A general report of Society activities with particular reference to membership, publications, finances and administrative matters relating to committee activities and inter-society relations.

Introduction of Newly Elected Officers.

The terms of the new officers, under the provision of the By-laws, begin at the close of the annual meeting.

Miscellaneous Business.

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Tuesday, June 25 **2 P.M.** **Second Session**

Testing; Reports of Administrative Committees

Report of Committee E-10 on Standards. T. R. Lawson, Chairman.

Reports on specifications and methods of test submitted under the procedure for acceptance and publication of new and revised tentative standards and tentative revisions of existing standards in the interim between annual meetings of the Society. Reports on new standing committees being organized on gaseous fuels and on chemical analysis of metals, and new sectional committee on petroleum products and lubricants. Reviews standardization projects considered during the year.

Report of Committee E-9 on Research. P. H. Bates, Chairman.

Contains a brief summary of research activities and the work of the several research committees.

Report of Committee E-1 on Methods of Testing. W. H. Fulweiler, Chairman.

Presents revisions in tentative methods of verification of testing machines and in definition of total strain method using dividers, set method, and approximate method without stress-strain diagram in connection with the procedures for determining yield strength appearing in definition of term yield strength. Announces organization of new technical committee on designation and interpretation of numerical requirements. Presents summary of activities of technical committees; including report of studies on the determination of average particle size of sub-sieve particulate substances by the dark field count method.

Measurement of Particle Size Distribution by Optical Methods. R. N. Traxler and L. A. H. Baum, The Barber Asphalt Co.

Studies the various factors influencing the determination of particle size distribution by means of the Wagner turbidimeter and develops technique for the dispersion of the finely pulverized solids. Compares the results obtained on cement, trap rock, silica, limestone, and green, red and black slate powders using the turbidimeter with the size distribution data given by an air analyzer of the type described by Roller. Concludes that a direct proportionality does not exist between surface area (concentration of suspension) and turbidity, and that turbidity is influenced by the particle size and optical properties of the dispersed solid.

The Relation Between the Tension Static and Dynamic Tests H. C. Mann, Watertown Arsenal.

Discusses a new development in the field of impact testing, a theory based on the first law of thermodynamics from which a definite relation between the static and dynamic tests is obtained. The application of the theory shows that the mechanism of the process of deformation to rupture, and the maximum stress developed, are essentially the same under both conditions of test. Shows previous theories regarding the relation between these two types of tests to be the results of misinterpretation of the test data and lack of complete knowledge and consideration of such factors as material volume, microstructure, and velocity of the force application.

The Hardness Testing of Light Metals and Alloys. R. L. Templin, Aluminum Company of America.

Discusses the application of hardness tests, which have attained so much success with ferrous metals, to general classes of commercial light alloy products. Points out that the effects of factors such as load-penetrator-time relationships, anvil or support, size and preparation of specimen, and relationships between different kinds of hardness and between hardness and the other static properties of the light alloys are quantitatively different from those obtained in ferrous metals.

A New Method and Machine for Dynamic Hardness Testing, with a Discussion of Its Accuracy and Advantages. W. M. Patterson, Tinius Olsen Testing Machine Co.

Describes the development of a new hardness scale, of definite physical units, in conjunction with the new Ballentine hardness testing machine. Shows that this scale, uniform throughout its entire range, can be developed by a comparison of absorbed energy (total energy minus rejected energy) to volume of permanent deformation. Presents results on alloys of lead, aluminum, and copper, cast iron, and soft and medium hard steels and discusses the accuracy and advantages of the tester as a laboratory and production instrument.

Informal Discussion on the Significance of "Yield Strength" of Metals in Design and Specifications.

Yield strength is defined by the Society as "the stress at which a material exhibits a specified limiting permanent set," and methods for its determination are given in Methods of Tension Testing of Metallic Materials (E 8 – 33). These methods apply both to material that has a "sharp-kneed" stress-strain diagram and to material whose stress-strain diagram in the region of yield is a smooth curve of gradual curvature.

Experience in the determination of this property for various materials is accumulating and questions have arisen regarding its significance and its utilization in design of structures and as a requirement in purchase specifications.

The purpose of this discussion is essentially to provide opportunity for statements of such experience and questions, and for presentation of critical comment thereon. The views of committees of the Society are being invited.

Excursions, Trips

Provisional Program for Thirty-Eighth Annual Meeting

(Continued)

Tuesday, June 25 8 P.M. Third Session

Symposium on the Place of Materials in Automobile Roads and Rides

It has been said that "there is probably no single machine in which so many principles of physics find their application in so small a space as in the modern automobile." The same thing might equally well be said of the materials employed in constructing the automobile and the roads on which it runs. It is the purpose of this symposium to treat in a systematic manner the part which these materials play in automobile roads and rides.

The content of the papers is not primarily intended to advance the knowledge of the specialists in this field but to stimulate discussion of the problems relating to these materials and the further advances which appear to be desirable and which the future may reasonably hold. To this end, the comments of all interested are solicited as discussion of the following three formal papers.

The Road. John S. Worley, University of Michigan.

The Tires. K. D. Smith, The B. F. Goodrich Co.

The Car.

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Wednesday, June 26 9.30 A.M. Fourth Session

Held Simultaneously with Fifth Session

Steel, Wrought Iron, Cast Iron

Report of Committee A-2 on Wrought Iron. H. W. Faus, Chairman.

Presents as tentative two specifications for wrought-iron sheets covering black and galvanized sheet materials, respectively. Reports consideration being given to preparation of new specification for single refined wrought-iron bars which will cover material made solely from new iron exclusive of scrap. Proposes adoption as standard of tentative revision in specifications for hollow rolled staybolt iron.

Report of Committee A-6 on Magnetic Properties. Thomas Spooner, Chairman.

Submits tentative revisions in the standard methods of test for magnetic properties of iron and steel and in the definitions of terms relating to magnetic testing. Summarizes committee activities on tests at high magnetizing forces and high induction core loss tests.

Report of Committee A-9 on Ferro-Alloys. Charles McKnight, Chairman.

Report of Committee A-1 on Steel. H. H. Morgan, Chairman.

Presents new tentative specifications for axle steel concrete reinforcement bars and for seamless low-carbon-steel still tubes for refinery service. Recommends adoption as standard of the tentative specifications for heat-treated steel elliptical springs; also adoption of the existing tentative revision in the standard specifications for rail-steel and billet-steel concrete reinforcement bars. Submits tentative revisions in the standard specifications covering carbon-steel rails, steel splice bars, carbon-steel bars for railway springs with special silicon requirements, steel and iron boiler tubes, commercial quality hot-rolled bar steels, and commercial cold-finished bar steels and cold-finished shafting. Presents as information proposed specifications for forged or rolled alloy-steel pipe flanges, forged fittings, and valves and parts for service at temperatures from 750 to 1100 F.

The Effect on the Elastic Properties of Heavy (3½ in. Thick) Steel Plate by Cold Bending and by Subsequent Stress Relief. C. H. Gibbons, Baldwin-Southwark Corp.

Describes tests made on 0.17 per cent carbon and 0.27 per cent carbon steel plate, 3½ in. thick, to determine whether it is necessary to bend heavy plate for cracking stills, etc., hot and whether the original elastic characteristics of the steel can be regained by stress relief. Presents stress-strain curves of specimens cut from various positions on both the tension and compression sides of plates bent cold in an ordinary bending roll and specimens from the same positions on parts of the same plate which were stress relieved at 1200 and 1600 F.

Endurance Testing of Rear Axle Gears and Gear Steels. J. O. Almen and A. L. Boegehold, General Motors Corp.

Describes a series of endurance tests on rear-axle gears which show that gear-tooth failures may be plotted on the familiar *S–N* curve when the gear stresses are properly calculated. Shows that the widely used Lewis formula for calculating gear-tooth stress leads to serious errors. Also indicates that the chief benefit obtained from the use of alloy steels is the reduction in amount of distortion which results in lower stress concentration through more uniform tooth contact. Gives rotating beam plain and notched bar fatigue test results for several gear steels.

Report of Committee A-3 on Cast Iron. Hyman Bornstein, Chairman.

Presents new tentative specifications for automotive gray-iron castings. Recommends revisions in the tentative specifications for chilled-tread cast-iron wheels, for gray-iron castings, and for cast-iron culvert pipe.

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Wednesday, June 26 9.30 A.M. Fifth Session

Held Simultaneously with Fourth Session

Paint, Timber, and Naval Stores

Report of Committee D-1 on Preservative Coatings for Structural Materials. Allen Rogers, Chairman.

Presents new tentative specifications for white pine wood to be used in weather tests of paints and for blue lead (basic sulfate); also methods of test for comparative hiding power of white pigments, alkali resistance of oleo-resinous varnishes, determining acid number of oleo-resinous varnishes, and skinning of varnish in closed containers. Recommends for adoption as standard the two tentative specifications for titanium barium and calcium pigments and the specifications for acetate ester of ethylene glycol mono ethyl ether (95 to 96 per cent). Recommends adoption as standard of the existing tentative revisions in the standard methods of routine analysis of yellow and orange pigments and of white linseed oil paints, and proposes new revisions as tentative in these two methods; also recommends adoption of the existing tentative revision in the standard methods of routine analysis of dry red lead.

Submits tentative revision in the standard specifications for raw tung oil, and changes for immediate adoption in the specifications for dry bleached shellac and shellac varnish. Proposes revisions in the tentative methods of test for tinting strength of white pigments or pigment pastes, for soluble nitrocellulose base solutions, and for mass color and tinting strength of dry color pigments or pastes.

Contains reports of subcommittees on testing of paint vehicles, on methods of analysis of paint materials, and on cellulose ester coatings; also gives summaries of activities of other subcommittees.

Report of Committee D-17 on Naval Stores. F. P. Veitch, Chairman.

Progress report of activities of subcommittees on acid and saponification number and unsaponifiable matter, and on viscosity of rosin.

Report of Committee D-10 on Shipping Containers. Edward Dahill, Jr., Chairman.

Recommends withdrawal of four tentative specifications for wooden boxes, namely, for the shipment of canned foods; for canned foods boxes, wirebound construction; for 4-one boxes and similar type boxes; and for boxes of nailed and lock-corner construction. Reports on plans of committee to prepare procedures for making tests on the materials and accessories used in the construction of containers, the designing or acceptance of apparatus for making these tests and the procedures to be followed in making tests of the completed containers.

Report of Committee D-7 on Timber. Hermann von Schrenk, Chairman.

Recommends adoption as standard of tentative specifications for creosote and for creosote - coal tar solution. Submits as information proposed revisions in the standard specifications for structural wood joist and plank, beams and stringers, and posts and timbers, which changes represent a rearrangement of the specifications and particularly the substitution of stress values for the grade names now in the A.S.T.M. standard. Recommends revisions in the tentative specifications for timber piles, condensing the specifications without sacrificing the clearness and keeping the basic provisions unchanged.

Provisional Program for Thirty-Eighth Annual Meeting

(Continued)

Methods of Testing Fire-Retardant Treated Wood. C. R. Brown, National Bureau of Standards.

Describes comparative tests on untreated and fire-retardant treated wood using the fire-tube test, devised by the Forest Products Laboratory, and the flame penetration test, developed at the National Bureau of Standards, in order to determine the relative suitability and proper uses of the two tests as measures of the effectiveness of treated wood in resisting the spread of fire and decreasing the damage therefrom.

The Distribution and Variations of Certain Strength and Elastic Properties of Clear Southern Yellow Pine Wood. A. W. Brust and E. E. Berkley, Washington University.

Presents experimental data on variations in maximum and elastic strength and stiffness of clear southern yellow pine. Discusses relations of these variations to cell structure, density, summer wood content, position in tree and species; also limitations of density and percentage of summer wood as strength criteria; the effect of variations in cell structure on mechanical properties of large timbers which are not indicated by only average values.

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Wednesday, June 26 2 P.M. Sixth Session

Rubber and Petroleum Products

Report of Committee D-11 on Rubber Products. H. A. Depew, Chairman.

Reports progress in development of methods of test for flex cracking of vulcanized rubber (three recognized procedures), flexing life of rubber-fabric combinations, accelerated aging of vulcanized rubber (Geer oven and Bierer bomb), effect on vulcanized rubber of air at elevated temperature and pressure (air bomb), and compression set of vulcanized rubber under constant deflection. Discusses new project to provide rubber test samples having standard properties for use as reference standards.

Recommends revision for immediate adoption in the standard specifications for cotton rubber-line fire hose for public and private fire department use. Submits proposed revisions in the standard methods of physical testing of rubber products and in the tentative specifications for insulated wire and cable: performance rubber compound; and class AO, 30 per cent Hevea rubber compound; also in specifications and tests for rubber insulating tape, and for friction tape for general use for electrical purposes.

Report of Committee D-2 on Petroleum Products and Lubricants. T. A. Boyd, Chairman.

Includes completely revised methods of test for flash point by means of the Tag closed tester and viscosity test by means of the Saybolt viscosimeter for publication as tentative revisions of the present standards. Submits editorial changes in the standard method of test for cloud and pour points, and proposes tentative revisions in the standard methods of test for distillation of crude petroleum, flash point by means of the Pensky-Martens closed tester, and saponification number. Recommends adoption as standard of the existing tentative revisions in the standard methods of test for dilution of crankcase oils; distillation of gasoline and similar products; precipitation number of lubricating oils; and water and sediment in petroleum products by means of centrifuge.

Reports progress of activities of subcommittees on corrosion test for lubricating oils, nomenclature, classification of automotive lubricants and the technical committee on fuel oils (including Diesel fuel). Contains extensive report of subcommittee on Sligh oxidation test, with results of cooperative tests on samples of three oils and one precipitation naphtha. Submits as information proposed test for oxidation number of lubricating oils by Sligh method.

The Effect of Volatility on Oil Consumption. L. L. Davis, Continental Oil Co., and R. D. Best.

Discusses the fact that volatility appears to be more of a factor in the consumption of oil than has been thought in the past and that it must be given consideration particularly in the future because of the basic lower rates of consumption found in the more recent design of engines. Describes the method and apparatus for testing and presents results obtained on several grades of oil at speeds of 40, 50 and 60 m.p.h.

Influence of Engine Design on Oil Consumption. M. O. Teetor, The Perfect Circle Co.

Discusses the theory of cylinder lubrication, using thick oil films and thin oil films. Describes the difficulties encountered maintaining uniformly thin oil films. Shows how high cylinder temperatures, thermal and mechanical distortion affect oil consumption and lubrication.

Wednesday, June 26 4 P.M. Seventh Session

Edgar Marburg Lecture

The purpose of the Edgar Marburg Lecture is to have described at annual meetings of the Society, by leaders in their respective fields, outstanding developments in the promotion of knowledge of engineering materials. Established as a means of emphasizing the importance of promoting knowledge of materials, the Lecture honors and perpetuates the memory of Edgar Marburg, first secretary of the Society.

Tenth Edgar Marburg Lecture: "Aircraft: Materials and Testing," by Dr. L. B. Tuckerman (see page 6).

Traces the development and utilization of materials in the aircraft field and makes an approach to the subject from the angle of the influence of design and construction in the development of materials.

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Wednesday, June 26 8 P.M.

A.S.T.M. Dinner

Award of Charles B. Dudley Medal to C. A. Hogentogler and E. A. Willis.

The Ninth Award of the Charles B. Dudley Medal will be made to C. A. Hogentogler and E. A. Willis, Senior Highway Engineer, and Assistant Highway Engineer, respectively, U. S. Bureau of Public Roads, for their paper on "Subgrade Soil Testing Methods," presented before the Society at the 1934 annual meeting.

The Relationship of Materials to the House of Today and Tomorrow.

The quest today is at once for a house that is better and that costs less to build. In the effort to reach this difficult objective, there is much careful scrutiny of the design of houses, of the materials available of which to construct them, and of the various possible methods of constructing them in the factory and on location. The program of this meeting is designed to give a general picture of problems and progress in this important field both here and abroad, and particularly from the materials side. The subject will be discussed in the following two addresses:

The Federal Housing Problem. Stewart McDonald, Assistant Administrator, Federal Housing Administration.

Role of Materials in Modern Housing. J. E. Burchard, Vice-President, Bemis Industries, Inc.

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Thursday, June 27 9.30 A.M. Eighth Session

Held Simultaneously with Ninth Session

Corrosion

Report of Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys. Jerome Strauss, Chairman.

Presents three new tentative specifications for 12, 19, and 28 per cent chromium steel castings, respectively, and one for annealed chromium-nickel-steel sheets, strips and plates. Reports progress on development of additional specifications for the various chromium-nickel cast steels, which are nearing completion. Discusses subcommittee activities in assembling and classifying data on chemical, physical, mechanical and fabricating properties of chromium and chromium-nickel steels, in studying specifications for welded austenitic steel wrought products; also corrosion, mechanical, and metallographic tests of alloys under jurisdiction of the committee, and additional specifications for various corrosion-resisting ferrous alloys in the form of flat products.

Provisional Program for Thirty-Eighth Annual Meeting

(Continued)

Report of Committee A-5 on Corrosion of Iron and Steel. F. F. Farnsworth, Chairman.

Presents for publication as tentative new specifications covering electrodeposited coatings of zinc on steel, of cadmium on steel, and of nickel and chromium on steel. Recommends adoption of the tentative recommended practice for safeguarding against embrittlement of hot-galvanized structural steel products and procedure for detecting embrittlement. Proposes editorial changes in the standard specifications for zinc-coated (galvanized) iron or steel farm-field and railroad right-of-way wire fencing and for iron or steel barbed wire, and recommends the withdrawal of the tentative specifications for these materials.

Reports results of latest inspections of the atmospheric corrosion tests at Annapolis and detailed results of inspections of the sea-water immersion tests. Gives summary of activities of subcommittees on methods of testing and embrittlement investigation. Reports on inspections of the exposure tests on galvanized sheets and presents a detailed tabulation of results of examinations of the specimens of metallic-coated hardware and tubular goods after approximately six years exposure at five locations.

Report of Sectional Committee on Specifications for Zinc Coating of Iron and Steel. J. A. Capp, Chairman.

Announces approval of four A.S.T.M. specifications for zinc-coated (galvanized) iron or steel wire, covering respectively, telephone and telegraph line wire, tie wires, wire strand and chain link fence fabric galvanized after weaving, for submission to American Standards Association for approval as American Standards. Reports on consideration being given to organizing future work of the committee to provide closer coordination on individual projects with the work of A.S.T.M. Committee A-5 on Corrosion of Iron and Steel.

Continuous-Flow Corrosion Tests of Steel Pipe. H. S. Rawdon and L. J. Waldron, National Bureau of Standards.

Describes an apparatus constructed for testing ferrous pipe on a much larger scale than has been used hitherto in laboratory tests. Pipe sections are used as specimens and assembled into columns through which water can be continuously circulated. The condition of the water with respect to pH value and oxygen is known and maintained within fairly close limits. Includes results obtained with an open-hearth steel pipe (2 in. in diameter) which forms the basis of discussion of a number of important points which should be observed in corrosion testing of this general nature.

Report of Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys. T. S. Fuller, Chairman.

Reports results of tensile strength, weight losses and elongation tests of specimens from the atmospheric corrosion tests being made on 24 non-ferrous metals and alloys exposed at nine test locations. Reports status of other corrosion tests in the field, including the studies of the resistance of representative non-ferrous metals and alloys to certain salt solutions and acids; also the studies of the effects of galvanic action on the behavior of metals when in contact with dissimilar metals.

Report of Committee D-14 on Screen Wire Cloth. J. R. Freeman, Jr., Acting Secretary.

Expensive report on atmospheric corrosion tests on seven compositions of non-ferrous screen wire cloth.

Paper appended:

"Atmospheric Exposure Tests on Non-Ferrous Screen Wire Cloth," by G. W. Quick, National Bureau of Standards, presenting a summary of the essential details and results of the exposure tests after approximately nine years at four test locations.

Corrosion Testing Methods. H. E. Searle and F. L. La Que, The International Nickel Co.

Describes the methods of equipment developed and used by the Development and Research Department of The International Nickel Co., Inc., in the investigation of corrosion problems in the field and in the laboratory. Discusses the usefulness of each type of corrosion test and their inter-connection and presents data showing the accuracy with which performance in service may be predicted.

The Control of Corrosion in Air-Conditioning Equipment by Chemical Methods. C. M. Sterne, Metropolitan Refining Co., Inc.

Discusses the problem of corrosion in air-conditioning equipment based on actual observations by the author in over 200 separate air-conditioning systems, handling both comfort and industrial conditioned spaces in many types of industry and in various cities throughout the United States. Presents results of corrosion tests run in many of these systems using various forms of chemical treatment; discusses these individual treatments as to their chemical constituents and their relative efficiencies.

Report of Committee D-19 on Water for Industrial Uses. Max Hecht, Chairman.

Contains report on problems in the standardization of methods for sampling water for industrial purposes which is intended to focus attention on the fundamental problems in connection with this subject and to serve as a guide in all industrial fields where sampling and analysis of water are required. Summarizes committee activities and reports consideration being given to methods of analysis, including the carbonate, hydroxide, phosphate and sulfate ions when these are present in boiler feed water.

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Thursday, June 27 9.30 A.M. Ninth Session

Held Simultaneously with Eighth Session

Coal, Textile Materials, Electrical Insulating Materials

Report of Sectional Committee on Classification of Coals. A. C. Fieldner, Chairman.

Recommends revision in the tentative specifications for classification of coals by rank changing the present boundary line between low and medium volatile bituminous coal from 77 per cent to 78 per cent fixed carbon. Contains brief summary of activities of subcommittees, including those on origin and composition of coal and methods of analysis, boundary lines for coal classification, correlation of scientific classification with use classification of coals, defining coal sizes and friability, and on nomenclature.

Report of Committee D-5 on Coal and Coke. A. C. Fieldner, Chairman.

Recommends as tentative, definitions of the terms gross calorific value and net calorific value, also a new method of test for screen analysis of coal, and two new tests for grindability of coal, one by the ball-mill method and the other by the Hardgrove-machine method. Recommends adoption as standard, with revision, of the tentative method of sampling coke for analysis. Includes brief summaries of activities of subcommittees on methods of testing, tolerances, coal friability, sampling coal at coal cleaning plants, and mechanical sampling and reduction of samples.

A Furnace for the Measurement of Coal-Ash Softening Temperature. E. P. Barrett, The Pennsylvania State College.

Describes a muffle-type gas furnace designed especially for the purpose of measuring ash-softening temperatures in accordance with A.S.T.M. specifications and compares results obtained with those secured with the pot-type furnaces now in use. Includes a critical discussion of the technique of ash-softening measuremen

Report of Committee D-13 on Textile Materials. H. J. Ball, Chairman.

Presents new tentative methods of testing cotton fiber for length and length distribution, fineness, immaturity count, and test for strength of raw cotton; also a test for shrinkage in laundering of silk and rayon woven broad goods, and a method for wet breaking strength of rayon fabric. Proposes tentative revisions in the standard specifications for textile testing machines and in the methods of test for tire cord (woven and on cones), for hose ducks and belt ducks, and for cotton sewing threads.

Recommends adoption as standard of the tentative specifications for holland cloth and submits revisions in the tentative specifications for asbestos yarn and asbestos roving. Recommends revisions in the tentative methods of test and tolerances for rayon, for tubular sleeving and braids, for woolen and worsted yarns; in the methods of estimating hard scoured wool in wool in the grease and in the tentative methods for the identification of fibers in textiles. Recommends revised definition of "direction of twist" defined in terms of "S" and "Z" twist. Presents further changes in the existing tentative revision in the standard general methods of testing woven textile fabrics.

Testing of the Physical and Chemical Properties of Wool by Means of the Microscope. Werner von Bergen, Forstmann Woolen Co.

Includes a discussion of the following properties and tests: nature of wool, description of the structure of the wool hair, kempy wool, fineness of wool and the testing of it by the wedge method, U. S. Wool Standard for Fineness, action of sunlight on wool on the sheep's back, method for determination of damage by sunlight, action of hydrogen peroxide, action of chlorine, test for bleached and chlorinated wool, action of alkalies, scouring, action of acids, carbonizing, mildew and bacteria damage.

Report of Committee D-9 on Electrical Insulating Materials. T. Smith Taylor, Chairman.

Presents new tentative method of testing shellac used for electrical insulation. Submits tentative revisions in the standard methods of testing electrical porcelain, and electrical insulating oils. Recommends proposed revisions in the tentative specifications for flexible varnished tubing and for black bias-cut varnished cloth tape; in the methods of testing varnishes, solid filling and treating compounds, sheet and plate materials, laminated tubes, laminated round rods, molding powders used in manufacturing molded electrical insulators, and flexible varnished tubing; also in the methods of test for power factor and dielectric constant, resistance to impact, and grading of natural mica.

A Modified Schering Bridge. W. B. Kouwenhoven, Johns Hopkins University, P. H. Dike, Leeds & Northrup Co., and J. B. McCurley, Johns Hopkins University.

Describes a modified form of the Schering bridge which possesses several novel features including a new method for balancing or compensating for the residual capacitance of the variable capacitor arm. The bridge also provides a low-voltage impedance scheme for adjusting the shields and guards to the proper potential. Discusses the method of operation, outlines the mathematical treatment of the bridge, and presents experimental results.

The Transformer Bridge. J. B. McCurley, Johns Hopkins University, W. B. Kouwenhoven, Johns Hopkins University, and P. H. Dike, Leeds & Northrup Co.

Describes two forms of the transformer bridge for measuring the power factor and dielectric constants of insulating materials at commercial frequencies. The bridge is very easy to operate and simplifies the question of guard and shield balances and other factors which require manipulation in the standard forms of the Schering bridge. The bridge is designated for the measurement of the constants of dielectric material whose power factor is fairly large.

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Thurday, June 27 Afternoon Open

Committee Meetings and Recreation
Golf Tournament, Excursions, Trips

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Thursday, June 27 8 P.M. Tenth Session

Held Simultaneously with Eleventh Session

Effect of Temperature on Metals, Fatigue of Metals

Report of Joint Research Committee of A.S.M.E. and A.S.T.M. on Effect of Temperature on the Properties of Metals. H. J. French, Chairman.

Submits proposed revisions in the two tentative methods of test for short-time and for long-time (creep) high-temperature tension tests of metallic materials. Contains brief statement of progress on committee projects including fatigue of steels at high temperatures, wear and seizure in metals at high temperatures, and corrosion studies on austenitic nickel-chromium steels. Announces organization of new subcommittee to consider the effects of low temperatures on metals. Discusses briefly the various researches sponsored by the committee. Presents detailed report of sponsored research at Battelle Memorial Institute on study of embrittlement of austenitic nickel-chromium steel when exposed for long periods to high temperatures.

Some Tests on Tin Bronzes at Elevated Temperatures. J. W. Bolton, The Lunkenheimer Co.

Gives results on creep tests and study of embrittlement characteristics recently conducted on the A.S.T.M. alloys specified as steam or valve bronze sand casting (B 60) and as sand castings of the alloy: copper 88 per cent, tin 8 per cent, zinc 4 per cent (B 61) by methods conforming to the new testing methods of the Society, at temperatures of 500, 550 and 600 F. The paper is confined to the presentation of data, as the equipment has already been described. Shows detrimental influence of eutectic on elevated temperature properties and suggests limiting temperatures and design stresses for these alloys.

Influence of Time on Creep of Steels. A. E. White, University of Michigan, C. L. Clark, University of Michigan, and R. L. Wilson, The Timken Steel and Tube Co.

Shows that results from tests of 500-hr. duration give, in general, more conservative results than do those of longer time, and that tests of this duration may prophesy more correctly the behavior under very long time periods (several thousand hours) than do tests of 1000 to 2000 hr. duration. Presents results from creep tests of approximately 10,000 hr. duration on plain carbon steel at 1000 F. under two stresses and from an alloy steel at this same temperature under four stresses.

Creep Characteristics of Aluminum Alloys. R. R. Kennedy, U. S. Army Air Corps, Wright Field.

Determines the creep characteristics at 400 and 600 F. of nine aluminum alloys which have been used or proposed for use at elevated temperatures. Shows that sand-cast aluminum-copper-nickel-magnesium alloy has the best creep characteristics of the alloys tested, and that some of the newer wrought and cast alloys were markedly inferior to this alloy in this respect, although their mechanical properties at room temperature were superior in some cases and they have better casting and forging properties.

Report of Research Committee on Fatigue of Metals. H. F. Moore, Chairman.

Presents extensive notes on fatigue tests of rotating-beam testing machines, either of the centrally loaded or the cantilever type, which cover testing machines and specimens, speed and vibration of testing machines, machining and finish of specimens, test procedure, recording and plotting data of rotating-beam fatigue tests, and the determination of endurance limit from *S-N* diagrams. Reports progress on the study of the X-ray as a means of detecting impending fatigue failure. States problems being discussed by committee including the fatigue strength of steel-core copper-coated wires (copperweld), experiments on determining the damage done to metal by occasional heavy overstress, and new types of testing machines for fatigue testing.

The Rotating-Arc Fatigue Machine for Testing Small Diameter Wire. J. N. Kenyon, Columbia University.

Describes a stress-reversal fatigue machine for small-diameter wire developed on the principle of a rotating arc. Vibrations or standing waves are dampened in an oil bath. The specimen automatically assumes the form of a circular arc by the elimination of flexural shear. The test method is equally adaptable to testing wire of any diameter.

High-Speed Fatigue Tests of Several Ferrous and Non-Ferrous Metals at Low Temperatures. W. D. Boone and H. B. Wishart, University of Illinois.

Presents results of tests made with two cantilever fatigue machines using 12,000 r.p.m. series motors to determine the endurance limits of cold-drawn steel, rail steel, gray cast iron, mehanite (alloy cast iron), duralumin, and brass using standard and notched fatigue specimens for temperatures of +80 F., +10 F., −20 F., and −40 F. In general the endurance limits increased with decrease in temperature. The stress concentration factors determined by the notched specimens showed no consistent change.

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Thursday, June 27 8 P.M. Eleventh Session

Held Simultaneously with Tenth Session

Waterproofing and Road Materials

Report of Committee D-8 on Bituminous Waterproofing and Roofing Materials. J. M. Weiss, Chairman.

Presents as tentative, new temperature volume correction table for asphaltic products. Proposes revision in standard specifications for woven cotton fabrics saturated with bituminous substances for use in waterproofing. Recommends revisions in the tentative specifications for asphalt for use in constructing built-up roof coverings; in three specifications for asphalt roofing surfaced respectively with powdered talc or mica, with fine mineral granules, or with coarse mineral granules; also specifications for asphalt shingles surfaced with coarse mineral granules. Includes progress report on accelerated weathering tests with data showing effect of accelerated weathering cycle as compared with outdoor exposure.

Provisional Program for Thirty-Eighth Annual Meeting

(Continued)

A Study Concerning a Modification of the Present Miscibility Test and Its Relationship with Probable Settlement Results. C. A. Downing, St. Louis Municipal Testing Laboratory.

Discusses a modified miscibility test utilizing the original conception that extreme dilution of mixing emulsions in the ratio of 50 ml. of emulsion to 150 ml. of distilled water serves as an accelerated stability test. Presents a method to predict the probable five-day settlement results, thus eliminating expensive delay and inconvenience often experienced by both consumers and producers of asphalt emulsions by being forced to wait for the release of materials. The apparatus consists of three 7-mm. glass tubes used as pipettes to extract samples from the top, middle and bottom levels of the diluted emulsions.

Investigations of the Physical Properties of Asphaltic Mixtures at Low Temperatures. L. F. Rader, The Polytechnic Institute of Brooklyn.

Describes the methods of test developed to determine the physical properties of asphaltic mixtures at low temperatures and to interpret the results with respect to the cracking and deterioration of asphalt paving mixtures. Presents results of tests showing the effect upon modulus of rupture, modulus of elasticity, and toughness of the following variations: chilling temperature, compaction of mixtures, proportions of mixtures and characteristics of asphalt, such as penetration, susceptibility, and softening point.

Report of Committee D-4 on Road and Paving Materials. M. H. Ulman, Chairman.

Presents new tentative temperature volume correction table for asphaltic products and method of test for determination of amount of material finer than No. 200 sieve in aggregates. Submits tentative revision in standard method of test for distillation of bituminous materials suitable for road treatment. Proposes adoption as standard, with revision, of the tentative method of test for ductility of bituminous materials. Recommends revisions in the tentative methods of testing emulsified asphalts and the test for residue of specified penetration.

Stability of Granular Mixtures. D. S. Berry, University of Michigan, and Michigan State Highway Dept.

Presents experimental data on stability of granular mixtures and discusses fundamental elements of stability including resistance to displacement under surface loads, and some apparent discrepancies in internal friction theories. Describes the testing apparatus developed and results obtained in bearing capacity tests, and tests to measure the relation between normal and tangential components of stress in granular mass.

The Penetration Method of Measuring Soil Resistance. W. S. Housel, Michigan State Highway Dept., and University of Michigan.

Describes the testing apparatus and method used in measuring soil resistance and presents data on standardization of penetration measurements, development of formulas for force resisting penetration, and definition of penetration index as developed to measure the shearing resistance of soil. Correlates penetration measurements with other methods of measuring soil resistance.

The Los Angeles Abrasion Machine for Determining the Quality of Coarse Aggregate. D. O. Woolf and D. G. Runner, U. S. Bureau of Public Roads.

Compares the Los Angeles and Deval abrasion test results with the service records of materials from 44 different sources used in various types of bituminous surface treatment of roads. Discusses suitability of the Los Angeles abrasion machine for determining the quality of crushed rock, gravel, and slag for use in bituminous paving together with the lack of agreement between the Deval test result and the service record.

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Friday, June 28 9.30 A.M. Twelfth Session

Held Simultaneously with Thirteenth Session

Symposium on Spectrographic Analysis

Spectrographic methods of analysis have been in use for sufficient time in certain laboratories to establish their reliability as a means for inspecting various materials to determine whether or not they meet specifications as to composition. This is particularly true in the case of zinc and other metals, in the analysis of which the spectrographic method has outstanding advantages. In the present session, Subcommittee III of Committee E-2 will submit in preliminary draft form proposed Standard Methods for the Quantitative Spectro-chemical Analysis of Zinc for Lead, Iron and Cadmium, of Zinc Die-Casting Alloys for Minor Constituents, and Impurities, and of Pig Lead for Copper, Bismuth, Silver, and Nickel. These will be open to discussion in anticipation of their formal submission next year as official tentative standards.

The following papers will be presented describing the methods and details of procedure that have been found applicable to the analysis of other metals. These papers, covering as they do the fields of ferrous, non-ferrous, and the precious metals, should prove of the utmost interest to those who are working in these fields as well as to many who are not yet actively engaged but interested in the possibilities of spectrographic control in their own industry.

Spectrographic Analysis of Steel Samples. W. R. Brode, Ohio State University.

The Use of the Spectrograph in the Platinum Industry. H. E. Stauss, Baker and Co., Inc.

Quantitative Spectrographic Analysis of Magnesium Alloys for Manganese and Silicon. J. S. Owens, The Dow Chemical Co.

The Spectrographic Determination of Impurities in Commercial Cadmium. Frances W. Lamb, Bohn Aluminum and Brass Corp.

The Purification of Graphite Electrodes for Spectrographic Use. G. W. Standen and L. Kovach, Jr., The New Jersey Zinc Co.

Report of Committee E-2 on Spectrographic Analysis H. V. Churchill, Chairman.

Brief progress report discussing activities of the committee. Presents proposed method for quantitative spectrochemical analysis of zinc for lead, iron and cadmium, applicable to any grade of zinc, providing the lead, iron and cadmium contents are less than 0.1 per cent.

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Friday, June 28 9.30 A.M. Thirteenth Session

Held Simultaneously with Twelfth Session

Ceramics, Refractories, Masonry Materials

Report of Committee C-3 on Brick. H. T. Shelley, Chairman.

Recommends tentative revisions in the specifications for building brick made from clay or shale and extensive changes in the methods of testing brick, which include procedures for modulus of rupture, compressive strength and absorption. Contains subcommittee report on weathering and porosity of brick, which reviews methods for classifying brick with respect to durability and suggests a basis for specification requirements.

Papers appended:

"The Relation of Freezing and Thawing Resistance to Physical Properties of Clay and Shale Building Brick," by J. W. McBurney. Presents comparisons between some of the physical properties of bricks and their resistance to freezing and thawing.

"Comparison of Natural Weathering with Laboratory Tests of Clay Brick," by D. E. Parsons, National Bureau of Standards. Gives data affording some comparisons between natural weathering and the results of laboratory tests.

Tests on Mortars for Reinforced Brick Masonry. M. O. Withey and K. F. Wendt, University of Wisconsin.

Discusses the strength, volume change, absorption, and workability of mortars which seemed sufficiently strong to serve in reinforced brick masonry. In this program most of the work is done with portland-cement mortars tempered with lime or clay as plasticizers. Variables in type of lime, type of clay, type of cement, and in curing condition are also included.

Pre-Stressed Ceramic Members. F. O. Anderegg, Consulting Specialist on Building Materials.

Discusses a ceramic beam in which advantage is taken of the high compressive strength of ceramic units in fabricating beams of very high load-carrying capacity by pre-stressing, whereby, in effect, the tensile strength on the underside of the beam is increased at the expense of some of the excess compressive strength in that part of the beam. The results are obtained to best advantage by combining high-grade units, preferably made with de-airing, high yield point steel rods, properly designed mortar, and careful workmanship.

Provisional Program for Thirty-Eighth Annual Meeting

(Continued)

Report of Committee C-10 on Hollow Masonry Building Units. D. E. Parsons, Chairman.

Recommends revisions in the tentative specifications for structural clay load-bearing wall tile, non-load-bearing tile, floor tile, in the methods of sampling and testing, and in the definitions of terms relating to structural clay tile.

A Wear Test for Flooring Materials. J. R. Shank, Ohio State University.

Describes a method of testing wear properties of flooring materials using the Dorry apparatus for which cylindrical test cores are cut from the material with an ordinary drill press, substituting a piece of copper pipe, with a small amount of No. 50 grain carborundum and water as an abrasive, for the usual diamond drill. Presents results on sandstones, marbles, granites, limestones, travertines, etc., slates, cement products and ceramic products.

A Test Procedure for Elastic Caulking Materials. D. W. Kessler, National Bureau of Standards.

Discusses the nature, uses, service requirements, and physical properties of the materials. Describes a test procedure devised to determine the necessary qualities of the materials and gives details of the testing apparatus and specimens. Refers to an investigation now in progress to correlate test results with service performance.

Report of Committee C-4 on Clay Pipe. G. T. Hammond, Chairman.

Report of Committee C-8 on Refractories. R. A. Heindl, Chairman.

Presents new definitions for insulating fire brick, insulating brick, calcining, burning, grog fire-clay mortar, and superduty fire-clay brick. Recommends adoption as standard of tentative method of chemical analysis of magnesite refractories and definitions of terms relating to refractories; also proposes adoption of the existing tentative revisions in the standard method of test for softening point of fire-clay brick and definitions for clay refractories.

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Friday, June 28 2 P.M. Fourteenth Session

Non-Ferrous Metals, Metallography

Report of Committee B-1 on Copper Wire. J. A. Capp, Chairman.

Proposes revisions in the standard specifications for bare concentric-lay copper cable (medium, hard or soft), providing for tests of completed cable and inclusion of new stranding table. Recommends tentative revision of the standard specifications for trolley wire to provide requirements for a higher conductivity trolley wire. Contains brief résumé of activities of subcommittees, including a progress report from the subcommittee on electrical transmission wire and cable specifications.

Report of Committee B-4 on Electrical-Heating, Electrical-Resistance and Electric-Furnace Alloys. Dean Harvey, Chairman.

Submits proposed revision in the tentative method of test for linear expansion of metals. Presents interesting summary of subcommittee activities on mechanical, electrical and life tests; also on cast and wrought alloys and thermostatic metals.

Report of Committee B-5 on Copper and Copper Alloys, Cast and Wrought. C. H. Mathewson, Chairman.

Presents two new tentative specifications for wrought phosphor bronze and for wrought silicon bronze bearings and expansion plates for bridges and structures, and a specification for copper-silicon alloy wire for general purposes.

Report of Committee E-4 on Metallography. C. H. Davis, Chairman.

Presents a comprehensive recommended practice for metallographic testing for publication as tentative which is a revision and combination of the standard methods of metallographic testing of iron and steel and of non-ferrous metals and alloys. Discusses X-ray symposium to be held at this annual meeting and arranged under the auspices of the committee.

Report of Committee B-7 on Light Metals and Alloys, Cast and Wrought. Sam Tour, Chairman.

Presents new tentative specifications for aluminum die-casting alloys in ingot form. Submits minor revisions in several existing specifications for aluminum wrought alloys.

Report of Committee B-6 on Die-Cast Metals and Alloys. J. R. Townsend, Chairman.

Presents new tentative specifications for lead- and tin-base alloy die castings. Reports results of physical tests of specimens after 5-year outdoor exposure, also an extensive report on investigation of the aluminum die-casting alloys. Reports on studies of the finishing of die castings.

Report of Committee B-2 on Non-Ferrous Metals and Alloys. R. F. Mehl, Chairman.

Recommends as tentative the proposed specifications for lead-coated copper sheets, previously published as information. Presents tentative revisions of the standard specifications for slab zinc (spelter). Recommends adoption as standard of the specifications for pig lead. Gives brief summary of subcommittee activities.

A Survey of Testing in the Precious Alloy Field with Special Reference to Testing Requirements for Duplex Alloys. T. A. Wright, Lucius Pitkin, Inc.

Sets forth those items to which tests are or should be applied, and outlines the types of tests required for the more important precious metals. The data are presented as a background by which the question of specifications and testing of precious metals may be approved. Presents data in an attempt to lay the foundation for the standardization of tests of gold-plated articles, commonly known as gold-filled and rolled-gold plate.

Making and Testing Single Crystals of Lead. B. B. Betty, University of Illinois.

Determines creep characteristics of specimens composed of only one crystal to eliminate the effect of movement of grain boundaries, which together with the deformation of the grains themselves appear to determine the creep in polycrystalline lead. Discusses the method of casting the crystals, involving a discussion of the temperature and temperature gradient control necessary. Describes an inexpensive, rapid and sufficiently accurate method of determining the crystallographic orientation of the crystals without the necessity of laborious and time-consuming X-ray method. Presents results of an actual creep test of a specimen and identifies planes of slip with definite crystallographic planes, known as octahedral planes.

Excusions, Trips

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Friday, June 28 8 P.M. Fifteenth Session

Cement, Lime, Concrete

Report of Committee C-1 on Cement. P. H. Bates, Chairman.

Recommends adoption as standard, with revision, of the existing tentative specifications for high-early-strength portland cement. Reports activities of subcommittees on masonry cement, low-heat and blended cements, volume change and soundness, plasticity tests, and on plastic mortar tests for portland cement. Contains preliminary report of the working committee on methods of chemical analysis on a cooperative study of a quick method for determining magnesium in cement; including two procedures developed respectively by F. P. Diener and J. C. Redmond. Reports on fourth tour of inspection of the cement reference laboratory.

Classification of Hydrated Limes by a Mobilometer. T. G. Dixon and J. R. Withrow, Ohio State University.

Discusses use of Gardner Mobilometer for testing plasticity of lime.

Informal Report of Sectional Committee on Specifications for Plastering. F. Leo Smith, Acting Chairman.

Report of Joint Committee on Standard Specifications for Concrete and Reinforced Concrete A. E. Lindau, Chairman.

Progress report describing the work of the Joint Committee in preparing detailed revisions in its earlier report of 1924 on Standard Specifications for Concrete and Reinforced Concrete.

Provisional Program for Thirty-Eighth Annual Meeting

(Continued)

Report of Committee C-13 on Concrete Pipe. Asa E. Phillips, Chairman.

Presents new tentative specifications for concrete irrigation pipe. Recommends for adoption as standard, with revision, the tentative specifications for cement-concrete sewer pipe and for reinforced-concrete sewer pipe. Submits extensive revisions in the tentative specifications for reinforced-concrete culvert pipe.

Report of Committee C-9 on Concrete and Concrete Aggregates. R. W. Crum, Chairman.

Presents new tentative methods of making compression tests of concrete using portions of beams broken in flexure, method of determining voids in coarse aggregate, tests for soundness of coarse and of fine aggregates by use of sodium sulfate or magnesium sulfate, and test for determination of amount of material finer than No. 200 sieve in aggregates. Recommends adoption as standard of the tentative specifications for ready-mixed concrete, with revision. Presents revisions in tentative specifications for concrete aggregates and test for apparent specific gravity of coarse aggregates. Proposes tentative revision of standard method of test for sieve analysis of aggregates for concrete. Includes a statistical study of data on sand and gravel.

Papers appended:

"Digest of Literature on Methods of Determining Permeability of Concrete," by T. G. Mooney, American Cement Corp.

"Methods of Tests for Determining Volume Changes in Concrete," by R. E. Davis, University of California.

"Report on Methods to Assure Durability of Concrete," by R. S. Greenman, Consulting Concrete Engineering.

"Comparisons of Different Types of Specimens for Compressive Strength Tests of Mortars," by H. J. Gilkey, Iowa State College, and H. W. Leavitt, Maine Technology Experiment Station.

Chemistry and Physics of Concrete Shrinkage. R. W. Carlson, Massachusetts Institute of Technology.

Presents test data which indicate that the finer particles of aggregate in concrete are compressed to a high degree by the shrinkage of the paste, and that the larger pieces of aggregate cannot be compressed materially by shrinkage. Shows that a mortar containing only very fine aggregate may shrink almost as much as pure cement paste, while the substitution of coarse aggregate causes a great reduction in shrinkage. Concludes that the paste in being unable to compress the larger piece of aggregate must develop minute cracks perpendicular to the surfaces of the aggregate and cites the reduction in modulus of elasticity due to drying as evidence that this condition obtains.

Determination of Modulus of Elasticity and Poisson's Ratio of Concrete, Variables Being Six Different Aggregates and Four Water-Cement Ratios at Ages of Fourteen Days to Four Years. L. H. Koenitzer, Kansas State College of Agriculture and Applied Science.

Continues the work of P. M. Noble reported at the annual meeting of the Society in 1931. Includes tests made on Noble's specimens at the ages of one and four years in both dry and wet condition. Shows that total aggregate mixes (various fineness moduli from 3.5 to 4.4) do not possess the same qualities as the concrete made up of limestone, flint, and gravel (water-cement ratios 0.6 to 0.9, consistencies 0.0 to 8.0 in. slumps). Gives data on 165 specimens as a result of over 55,000 measurements.

Research on Concrete Disintegration. H. S. Mattimore and G. A. Rahn, Pennsylvania State Highway Dept.

Presents results of exposure tests on forty-five concrete specimens 36 by 12 by 36 in. made from two different sands and two different cements, with different percentages of cement and coarse and fine aggregate and with different water contents. The specimens were exposed in northwestern Pennsylvania since the fall of 1930. They were buried 2 ft. in the ground, allowing 1 ft. of the concrete to be exposed. These specimens or small walls were constructed under laboratory supervision and had been under constant study since their erection in the fall of 1930.

Personals

News Items concerning the activities of our members will be welcomed for inclusion in this column. Such news items are of very great interest to the membership at large and the number should be considerably augmented.

C. M. JOHNSON, Chief Chemist, Park Works, Crucible Steel Co. of America, was recently elected to membership in Sigma XI, University of Pittsburgh, in recognition of his contributions to the chemistry of steel analysis, control and manufacture.

RIEHLE BROS. TESTING MACHINE Co. has become a part of American Machine and Metals, Inc. and Mr. ABBOTT F. RIEHLE will continue as general manager with headquarters at the new executive office, 100 Sixth Ave., New York City. The Riehle engineering staff has been transferred to the plant of American Machine and Metals, Inc., in East Moline, Ill.

R. C. STRATTON, Supervising Chemical Engineer, Travelers Insurance Co., has been appointed chairman of the newly organized Committee on Safety of the American Institute of Chemical Engineers. He has also been appointed the representative of the Institute on the Committee on Cooperation with Other Societies sponsored by the American Society of Safety Engineers.

E. L. MORELAND, Member of Firm, Jackson & Moreland, has been appointed Head of the Department of Electrical Engineering, Massachusetts Institute of Technology. He will continue his active affiliation as Senior Partner in his firm.

H. E. WIEDEMANN, Consulting Chemist, St. Louis, was elected national president of Alpha Chi Sigma, chemical fraternity, at the last conclave.

S. G. BLAYLOCK, Managing Director, Consolidated Mining and Smelting Co. of Canada, and President of the Canadian Institute of Mining and Metallurgy, has been awarded the Institute's Platinum Medal for distinguished contribution to his country's mineral industry.

WILLIAM MUESER is now Resident Engineer-Inspector in Charge, Federal Emergency Administration of Public Works, 201 Pape Bldg., Stapleton, Staten Island, N. Y.

M. E. GILMORE, formerly Vice-President and General Manager, R. W. Hebard & Co., Inc., New York City is now State Engineer-Inspector, Public Works Administration, New York City.

CENTRAL SCIENTIFIC CO., who are represented in the Society by Mr. S. R. Evans, have moved to their new plant at 1700 Irving Park Boulevard, Chicago, Ill.

HSIANG-MENG SUN, formerly Directing Engineer, Reconstruction Bureau, Kiangsu Provincial Government, Chinkiang, Kiangsu, China, is now with the Bureau of Public Works, City Government of Greater Shanghai, China.

C. B. NOLTE, formerly President, Robert W. Hunt Co., has become President of the Crane Co, JAMES C. OGDEN, formerly Vice-President in charge of the Hunt Company's eastern and foreign activities at New York will succeed Mr. Nolte as President. F. M. RANDLETT formerly Pacific Coast Manager, will become Vice-President and General Manager of the company at Chicago.

GEORGE E. WARREN, Vice-President of the Southwestern Portland Cement Co., Osborn, Ohio, was recently named President of the Construction League of Dayton, Ohio, at a meeting of its board of directors.

MYRON A. SWAYZE who for a number of years has been Research Director of the Lone Star Cement Co., has been made Research Director of the International Cement Corp. He will continue to make his headquarters in Hudson, N. Y.

Addresses Wanted

Anyone knowing the present address of any of the following members, whose last known addresses are given below, is asked to notify the Secretary-Treasurer:

FRANCIS B. COYLE, Sandusky Foundry and Machinery Co., Sandusky, Ohio.

JOHN A. HEYSER, Petroleum Engineer, Wilshire Oil Co., Inc., 2455 E. Twenty-seventh St., Los Angeles, Calif.

EMIL CHARLES POHLMAN, Vice-President and General Manager, Novo Cement Co., Ltd., 4441 Santa Fé Ave., Los Angeles, Calif.